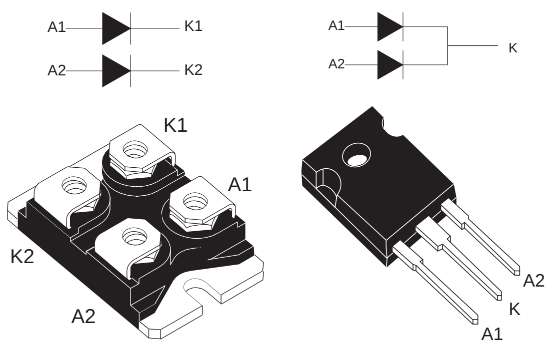
STTH6003TV/CW

HIGH FREQUENCY SECONDARY RECTIFIER

MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	**2 x 30 A**
V_{RRM}	**300 V**
V_F **(max)**	**1 V**
trr (max)	**55 ns**



ISOTOP™
STTH6003TV

TO-247
STTH6003CW

FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY
- INSULATED PACKAGE: ISOTOP
  Insulation voltage: 2500 V_{RMS}
  Capacitance: < 45 pF
- LOW INDUCTANCE AND LOW CAPACITANCE ALLOW SIMPLIFIED LAYOUT

DESCRIPTION

Dual rectifiers suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged either in ISOTOP or in TO-247, this device is intended for use in low voltage, high frequency inverters, free wheeling operation, welding equipments and telecom power supplies.

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				300	V
$I_{F(RMS)}$	RMS forward current			ISOTOP	100	A
$I_{F(RMS)}$	RMS forward current			TO-247	60	A
$I_{F(AV)}$	Average forward current	ISOTOP	Tc = 95°C δ = 0.5	Per diode Per device	30 60	A
		TO-247	Tc =135°C δ = 0.5	Per diode Per device	30 60	A
I_{FSM}	Surge non repetitive forward current.	ISOTOP	tp = 10 ms sinusoidal		400	A
		TO-247	tp = 10 ms sinusoidal		300	A
I_{RSM}	Non repetitive peak reverse current		tp =100 µs square		4	A
T_{stg}	Storage temperature range			ISOTOP	- 55 to + 150	°C
				TO-247	- 65 to + 175	°C
Tj	Maximum operating junction temperature			ISOTOP	150	°C
				TO-247	175	°C

ISOTOP is a registered trademark of STMicroelectronics

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to case	ISOTOP	Per diode Total	1.4 0.75	°C/W
		TO-247	Per diode Total	1 0.55	
$R_{th\ (c)}$			Coupling	0.1	

When the diodes 1 and 2 are used simultaneously:

ΔTj (diode 1) = P (diode 1) x $R_{th(j-c)}$ (per diode) + P (diode 2) x $R_{th(C)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	V_R = 300 V	Tj = 25°C			60	µA
			Tj = 125°C		60	600	
V_F **	Forward voltage drop	I_F = 30 A	Tj = 25°C			1.25	V
			Tj = 125°C		0.85	1	

Pulse test : * tp = 5 ms, δ < 2 %

** tp = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation:
P = 0.75 x $I_{F(AV)}$ + 0.008 x $I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Tests conditions		Min.	Typ.	Max.	Unit
trr	I_F = 0.5 A Irr = 0.25 A I_R = 1A	Tj = 25°C			40	ns
	I_F = 1 A dI_F/dt = - 50 A/µs V_R = 30 V				55	
tfr	I_F = 30 A dI_F/dt = 200 A/µs	Tj = 25°C			350	ns
V_{FP}	V_{FR} = 1.1 x V_F max.				5	V
S_{factor}	Vcc = 200 V I_F = 30 A	Tj = 125°C		0.3		-
I_{RM}	dI_F/dt = 200 A/µs				11	A

Fig. 1: Conduction losses versus average current (per diode).

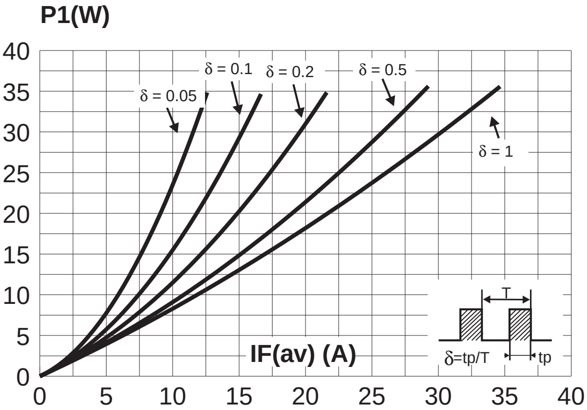


Fig. 2: Forward voltage drop versus forward current (maximum values, per diode).

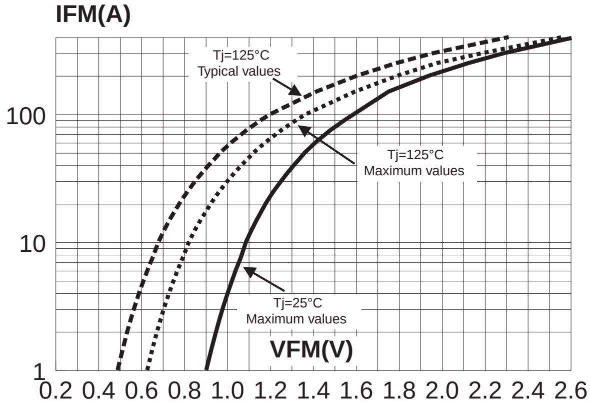


Fig. 3a: Relative variation of thermal impedance junction to case versus pulse duration (ISOTOP).

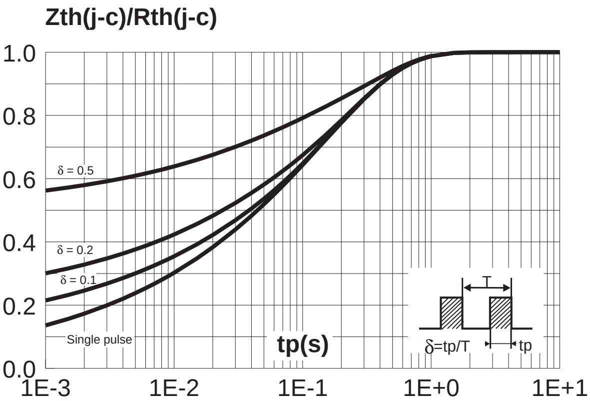


Fig. 3b: Relative variation of thermal impedance junction to case versus pulse duration (TO-247).

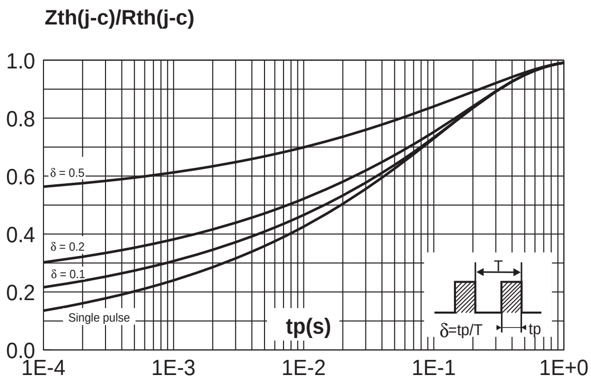


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence, per diode).

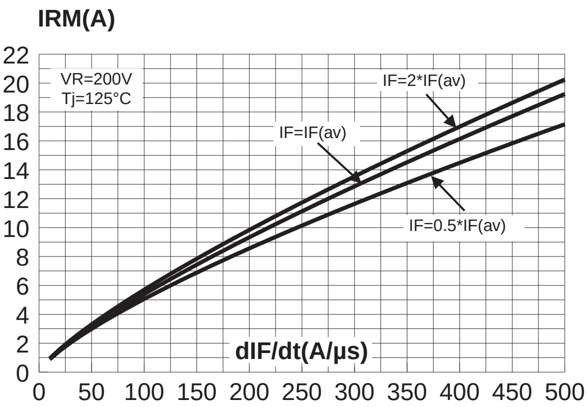


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence, per diode).

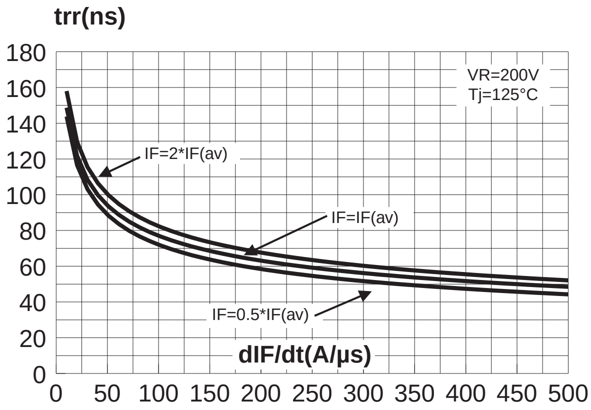


Fig. 6: Softness factor (tb/ta) versus dI_F/dt (typical values, per diode).

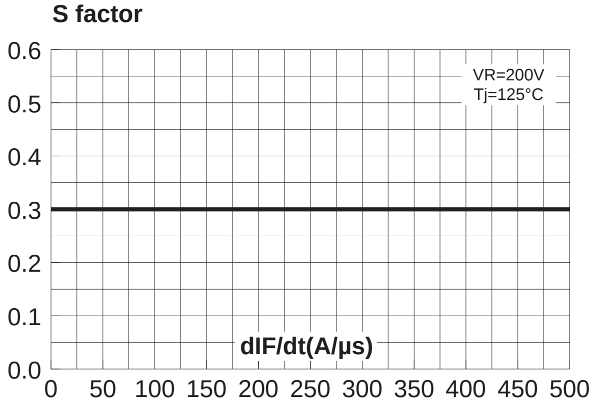


Fig. 7: Relative variation of dynamic parameters versus junction temperature (reference: Tj = 125°C).

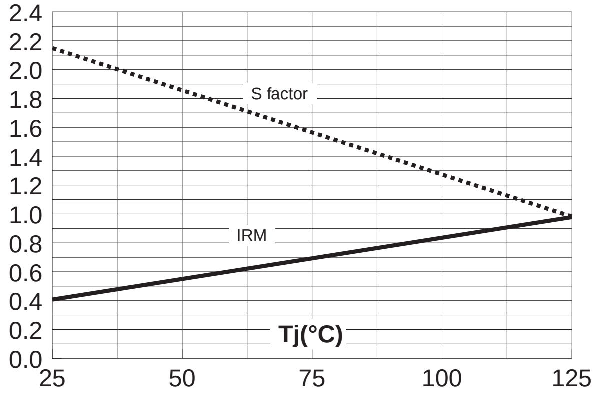


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence, per diode).

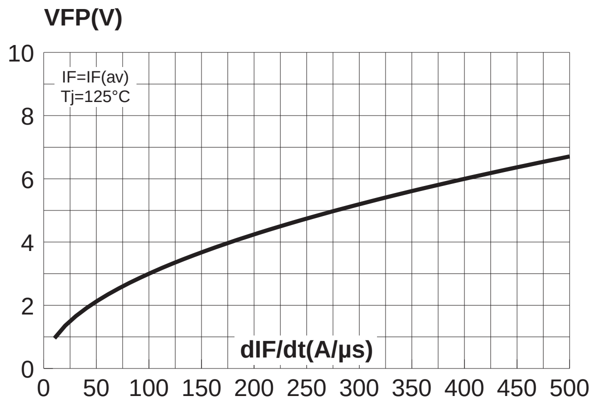
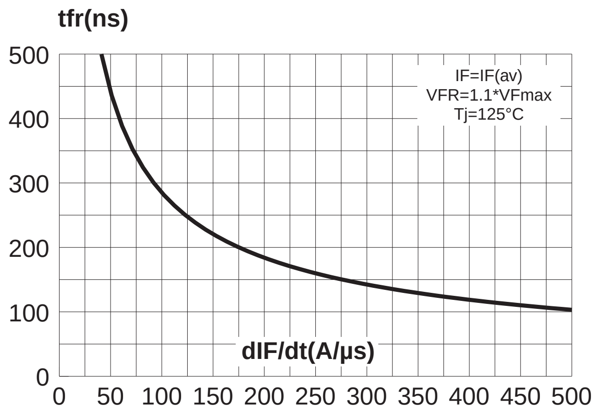
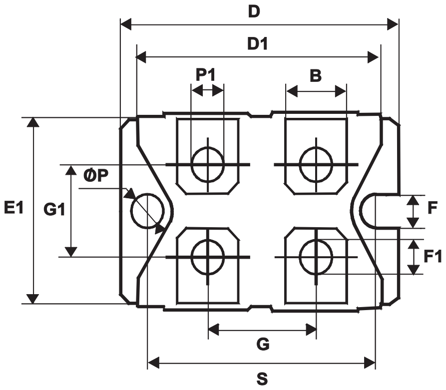
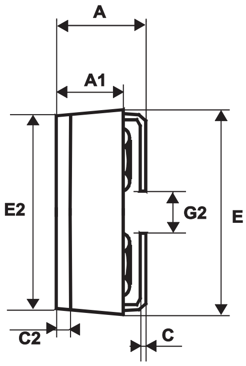


Fig. 9: Forward recovery time versus dI_F/dt (90% confidence, per diode).



PACKAGE MECHANICAL DATA
ISOTOP

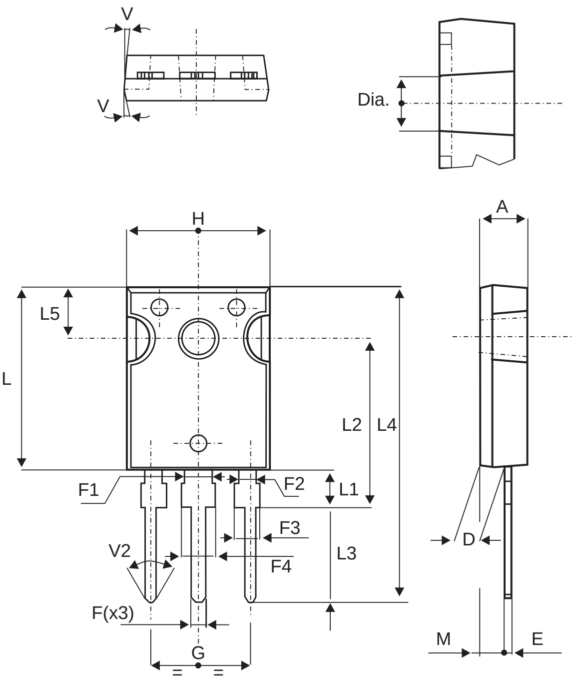




REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

PACKAGE MECHANICAL DATA

TO-247



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH6006TV1	STTH6006TV	ISOTOP	27g without screws	10 with screws	Tube
STTH6006CW	STTH6006CW	TO-247	4.36g	30	Tube

- Cooling method: by conduction (C)
- Recommended torque value (ISOTOP): 1.3 N.m.
- Recommended torque value (TO-247°: 0.8 N.m.
- Maximum torque value (ISOTOP): 1.5 N.m.
- Maximum torque value (TO-247): 1.0 N.m.
- Epoxy meets UL 94,V0

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